


INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

REC'D 28 SEP 2004

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Applicant's or agent's file reference 02107/PCT-dc		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IT 02/00478	International filing date (day/month/year) 19.07.2002	Priority date (day/month/year) 19.07.2002	
International Patent Classification (IPC) or both national classification and IPC H02M1/00			
Applicant STMICROELECTRONICS S.R.L. et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 2 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand 13.02.2004		Date of completion of this report 24.09.2004	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer Braccini, R Telephone No. +49 89 2399-2470	



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IT 02/00478

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-8 as originally filed

Claims, Numbers

1-10 filed with telefax on 22.04.2004

Drawings, Sheets

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IT 02/00478

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 10

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 10 are so unclear that no meaningful opinion could be formed (*specify*):

see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the Standard.

☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-9
	No: Claims	
Inventive step (IS)	Yes: Claims	1-9
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-9
	No: Claims	

2. Citations and explanations

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IT 02/00478

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. Claim 10 does not meet the requirements of Art. 6 PCT in that the matter for which protection is sought is not clearly defined. The claim attempts to define the subject-matter in terms of the result to be achieved (a starting circuit able to sustain a supply voltage greater than...), which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

2. Reference is made to the following document:
D1: EP-A-0 585 788 (POWER INTEGRATIONS INC) 9 March 1994
3. In the following discussion, the conformity of the claims will be examined for novelty, as defined in Art. 33(2) PCT, and for inventive step, as defined in Art 33(3) PCT. In addition, other aspects such as clarity requirements of Art. 6 PCT may be discussed as appropriate.
4. The application relates to a start-up circuit for a controller of a switching mode power supply.
5. Independent claim 1 does not meet the requirements of Art. 6 PCT in that the matter for which protection is sought is not clearly defined:
 - i) The expression "supply voltage coming from" is vague and unclear and leaves the reader in doubt as to the meaning of the technical features to which it refers, thereby rendering the definition of the subject-matter of said claims unclear.
 - ii) The term "two-way regulator" has no well-recognised meaning.
 - iii) The following functional statements do not enable the skilled person to determine which technical features are necessary to perform the stated function: "being able to supply the first supply voltage to the second terminal at the switching on and to supply the second voltage to the third terminal

when the supply voltage is increased".

- 5.1 In order to assess novelty and inventive step of unclear claim 1, the claimed circuit is interpreted in the light of Figure 3 and corresponding passages of the description. In view of the above unclarities, the following interpretation is within the scope of claim 1:

A starting circuit (13) for a switching mode power supply, the starting circuit comprising:

a first supply voltage (V_{in}) terminal, a second supply voltage (V_{cc}) terminal and a third supply voltage terminal (30);

a first current path between said first terminal and said third terminal (30);

a second current path between said third terminal (30) and said second terminal;

characterized by further comprising a MOSFET transistor (M3) having the drain-source path placed along said second current path, the transistor (M3) operating in the third quadrant at the start of the power supply and operating in the first quadrant after the voltage (V_{cc}) of the second terminal has reached a predetermined threshold, wherein the gate of the transistor (M3) is connected to the cathode of a Zener diode (Dz2), whose cathode is grounded, thereby clamping the voltage of the third terminal (30) to the breakdown voltage of the Zener diode (Dz2) less the gate-source voltage of the transistor (M3).

6. The closest prior art is represented by document D3. It discloses an IC controller for a switching mode power supply, which includes an integrated high voltage power MOSFET with a low voltage tap in the drift region. The high voltage present during initial power-up is dropped across the JFET part of the MOSFET and supplies a regulator with power either temporarily or continuously to operate a PWM modulator in the chip.
- 6.1. The device of claim 1 differs from the known circuit in that a MOSFET transistor (two-way regulator) is used for alternatively constituting a first supply path from the main power supply (V_{in}) toward the controller, at power-up of the power supply, and a second supply path from the self supply circuit toward the controller, when the self supply voltage has increased. Moreover, the MOSFET transistor has its gate connected to a Zener diode and acts as a clamping device for the controller supply voltage.
- 6.2. Hence, the technical solved problem with respect to the arrangement of the prior art is an improvement in error detection and safety in electric vehicle control. In

fact, a fault in the input means, controller hardware or software does not result in user control loss.

- 6.3 Hence, the objective problem addressed by these differentiating features is to provide a simplified power-up circuit for a controller of a switching mode power supply, capable of high efficiency operation and protecting the controller against transient and overvoltages.

Claim 1 meets therefore the requirements of novelty and inventive step referred to in Art. 33(2) and 33(3) PCT.

7. The dependent claims 2 to 9 relate to preferred embodiments of the circuit of claim 1. They fulfil therefore also the requirements of novelty and inventive step.
8. The industrial applicability (Art. 33(4) PCT) in view of the cited documents is obviously given for the subject-matter of all claims.